

**Claim Listing**        This listing of claims will replace all prior versions and listings of claims in the application:

Claims 1 – 22 (canceled)

Claims 23 – 34        (canceled)

Claim 35.        (previously amended) A composition useful for detecting and quantitating DNA-activated protein kinase (DNA-PK) activity in a biological sample comprising a synthetic peptide substrate selected from the group consisting of Glu Pro Pro Leu Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 11), Glu Pro Pro Gln Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 15), Glu Pro Pro Leu Thr Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 16), Pro Glu Glu Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 18) and Pro Glu Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 19).

Claims 36 – 52        (canceled)

Claims 53 – 98        (canceled)

99.        (currently amended) A kit for detecting and quantitating DNA-activated protein kinase (DNA-PK) activity, comprising:

- (a)        a phosphate donor;
- (b)        a composition useful for detecting and quantitating DNA-activated protein kinase (DNA-PK) activity in a biological sample comprising a synthetic peptide substrate selected from the group consisting of a ~~composition useful for~~

specific detection and quantitation of DNA-PK which comprises a synthetic peptide substrate defined by the following features to provide specific recognition and phosphorylation by DNA-PK: (1) a one phosphate-accepting amino acid pair selected from the group consisting of serine-glutamine (Ser-Gln) (SQ), threonine-glutamine (Thr-Gln) (TQ), glutamine-serine (Gln-Ser) (QS), or glutamine-threonine (Gln-Thr) (QT); (2) enhancer amino acids, selected from the group consisting of glutamic acid or glutamine, immediately adjacent at the amino or carboxyl side of the amino acid pair and forming an amino acid pair enhancer unit; (3) a first spacer sequence at the amino terminus of the amino acid pair enhancer unit; (4) a second spacer sequence at the carboxyl terminus of the amino acid pair enhancer unit, which spacer sequences may include any combination of amino acids that does not provide a phosphorylation site consensus sequence motif for another protein kinase; and (5) a tag moiety, which may be an amino acid sequence or another chemical entity that permits separating the synthetic peptide from the phosphate donor; and Glu Pro Pro Leu Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 11), Glu Pro Pro Gln Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 15), Glu Pro Pro Leu Thr Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 16), Pro Glu Glu Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 18) and Pro Glu Ser Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 19); and

(c) a means for detecting a phosphorylated synthetic peptide substrate, whereby detection of said phosphorylated synthetic peptide substrate is utilized to determine an amount of DNA-PK activity in said biological sample.

100. (original) The kit of Claim 99, wherein said phosphate donor is ATP.

101. (canceled)

102. (currently amended) The kit of ~~Claims~~ Claim 99, further including a negative control peptide selected from the group consisting of Glu Pro Pro Leu Ser Glu Gln Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 20), Pro Glu Ser Glu Gln Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 23), Glu Pro Pro Leu Ala Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 21), Pro Glu Glu Ala Gln Glu Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 24) and Pro Glu Glu Ser Glu Gln Ala Phe Ala Asp Leu Trp Lys Lys (SEQ ID NO: 25).

103. (original) The kit of Claim 99, further including buffers.

104. (original) The kit of Claim 99, further including a preparation of DNA-PK.

105. (original) The kit of Claim 99, further including a reagent to detect a phosphorylated peptide substrate.

Claims 106 – 111. (canceled)